

What is claimed is:

1. A projection type cathode ray tube device comprising a vacuum envelope which includes a rectangular panel portion having a phosphor screen formed on an inner surface thereof, a neck portion housing an electron gun which irradiates an electron beam inside thereof, a funnel portion for connecting the panel portion and one end of the neck portion, and a stem portion for sealing the other end of the neck portion, a deflection yoke which makes the electron beam scan on the phosphor screen, and a convergence yoke, wherein

the neck portion includes a first neck portion which is arranged at the funnel portion side and has a first outer diameter, the second neck portion which is arranged closer to the stem portion side than the first neck portion and has a second outer diameter, and a third neck portion which connects the first neck portion with the second neck portion, wherein the first outer diameter is smaller than the second outer diameter,

the deflection yoke is arranged in a transitional region between the funnel portion and the first neck portion and the convergence yoke is arranged to stride over the second neck portion and the third neck portion, and

first magnets which have different polarities from each other in the horizontal direction are arranged at upper and lower positions of an opening portion of the deflection yoke, and the first magnet arranged at the upper side of the deflection yoke

opening portion and the first magnet arranged at the lower side of the deflection yoke opening portion differ in polarity at left and right sides.

2. A projection type cathode ray tube device according to claim 1, wherein the deflection yoke includes a coil support body which holds and fixes a pair of horizontal deflection coils thereto, and the pair of magnets are mounted and fixed to the coil support body.

3. A projection type cathode ray tube device according to claim 1, wherein the deflection coil is arranged in a state where a distance between vertical deflection coils is set to 0.8 mm or less.

4. A projection type cathode ray tube device comprising a vacuum envelope which includes a rectangular panel portion having a phosphor screen formed on an inner surface thereof, a neck portion housing an electron gun which irradiates an electron beam inside thereof, a funnel portion for connecting the panel portion with one end portion of the neck portion, and a stem portion for sealing the other end of the neck portion, a deflection yoke which makes the electron beam scan on the phosphor screen, and a convergence yoke, wherein

the neck portion includes a first neck portion which is arranged at the funnel portion side and has a first outer diameter, the second neck portion which is arranged closer to the stem portion side than the first neck portion with has a second outer

diameter, and a third neck portion which connects the first neck portion with the second neck portion, wherein the first outer diameter is smaller than the second outer diameter,

the deflection yoke is arranged in a transitional region between the funnel portion and the first neck portion and the convergence yoke is arranged to stride over the second neck portion and the third neck portion,

first magnets which have different polarities from each other in the horizontal direction are arranged at upper and lower positions of an opening portion of the deflection yoke, and the first magnet arranged at the upper side of the deflection yoke opening portion and the first magnet arranged at the lower side of the deflection yoke opening portion differ in polarity at left and right sides, and

second magnets which have polarities different from each other in the tube axis direction of the cathode ray tube are arranged in a circumference of the opening portion of the deflection yoke.

5. A projection type cathode ray tube device according to claim 4, wherein the deflection yoke includes a coil support body which holds and fixes horizontal deflection coils thereto, and at least the pair of magnets are mounted and fixed to the coil support body.

6. A projection type cathode ray tube device according to claim 4, wherein the deflection coil is arranged in a state

where a distance between vertical deflection coils is set to
0.8 mm or less.